

**We claim:**

1. A method of treating teeth with fluoride, comprising:
  - a) dispensing a self-foaming fluoride-containing gel from an aerosol container into the trough of a dental tray;
  - b) placing the trough of the dental tray containing the self-foaming fluoride containing gel into engagement with the teeth to be treated, and
  - c) thereafter, allowing the self-foaming gel to transform into a foam while said dental tray is in engagement with the teeth.
2. The method of claim 1 wherein the fluoride-containing gel comprises:
  - a) a water soluble fluoride component present in an amount sufficient to provide from about 0.5 to about 10.0% by weight available fluoride;
  - b) from about 2.0 to about 30.0% by weight of an oil-in-water emulsifier;
  - c) from about 0.5 to about 30.0% by weight of a surfactant;
  - d) from about 0.5 to about 5.0% by weight of a micro-emulsion thickener;and optionally
  - e) from about 0.5 to about 10.0% by weight of a gel clarifying agent.
3. The method of claim 1 wherein the fluoride-containing gel contains from about 0.5 to about 5.0% available fluoride.
4. The method of claim 3 wherein the fluoride-containing gel contains from about 1.0 to about 3.0% available fluoride.
5. The method of claim 1, wherein said water soluble fluoride component is selected from the group consisting of sodium fluoride, sodium monofluorophosphate, stannous fluoride, fluoroalkylphosphate salts, quaternary ammonium fluorides and mixtures thereof.

6. The method of claim 5, wherein said water soluble fluoride component is sodium fluoride.
7. A foamable dental fluoride gel composition, comprising:
  - a) from about 0.5 to about 10.0% by weight of a water soluble fluoride component;
  - b) from about 2.0 to about 30.0% by weight of an oil-in-water emulsifier;
  - c) from about 0.5 to about 30.0% by weight of a surfactant; and
  - d) from about 0.5 to about 5.0% by weight of a micro-emulsion thickener;
8. The foamable dental fluoride gel of claim 7, wherein said water soluble fluoride component is selected from the group consisting of sodium fluoride, sodium monofluorophosphate, stannous fluoride, fluoroalkylphosphate salts, quaternary ammonium fluorides and mixtures thereof.
9. The foamable dental fluoride gel composition of claim 8, wherein said sodium fluoride is present in an amount of from about 1.0 to about 22.2% by weight.
10. The foamable dental fluoride gel composition of claim 9, wherein said sodium fluoride is present in an amount from about 1.0 to about 10.0% by weight.
11. The foamable dental fluoride gel composition of claim 10, wherein said sodium fluoride is present in an amount from about 2.0 to about 6.0% by weight.
12. The foamable dental fluoride gel composition of claim 7, wherein said oil-in-water emulsifier is a blend of a first and a second emulsifier.
13. The foamable dental fluoride gel composition of claim 12, wherein the ratio of said first emulsifier to said second emulsifier is about 2:1.

14. The foamable dental fluoride gel composition of claim 12, wherein said first emulsifier present in an amount of from about 1.0 to about 20.0% by weight.

15. The foamable dental fluoride gel composition of claim 14, wherein said first emulsifier is present in an amount of from about 1.0 to about 10.0% by weight.

16. The foamable dental fluoride gel composition of claim 7, wherein said emulsifier is selected from the group consisting of cetyl phosphate, stearic acid, PPG-5, ceth phosphate, cetearyl alcohol, dicetyl phosphate, ceteth-10 phosphate, polyoxyethylene (10) oleyl alcohol phosphate, polyoxyethylene (3) oleyl alcohol phosphate, cetostearyl alcohol, stearyl alcohol, oleyl alcohol, behenic acid, cetyl phosphate, stearic acid, fatty alcohols with linear carbon chains, phosphated cetyl ether and mixtures thereof.

17. The foamable dental fluoride gel composition of claim 12, wherein said first is polyoxyethylene (10) oleyl alcohol phosphate.

18. The foamable dental fluoride gel composition of claim 12, wherein said second emulsifier is present in an amount from about 1.0 to about 10.0% by weight.

19. The foamable dental fluoride gel composition of claim 18, wherein said second emulsifier is present in an amount from about 1.0 to about 6.0% by weight.

20. The foamable dental fluoride gel composition of claim 12, wherein said second emulsifier is polyoxyethylene (3) oleyl alcohol phosphate.

21. The foamable dental fluoride gel composition of claim 12, wherein said first emulsifier is polyoxyethylene (10) oleyl alcohol phosphate and said second emulsifier is polyoxyethylene (3) oleyl alcohol phosphate.

22. The foamable dental fluoride gel composition of claim 12, wherein said first emulsifier is DEA oleth-10-phosphate and said second emulsifier is DEA oleth-3-phosphate.

23. The foamable dental fluoride gel composition of claim 7, wherein said surfactant is present in an amount from about 1.0% to about 10.0% by weight.

24. The foamable dental fluoride gel composition of claim 7, wherein said surfactant is selected from sodium lauryl ether sulfate, ammonium lauryl ether sulfate, sodium lauryl sarcosinate, sodium-N-methyl-N-oleyl-taurate, Disodium N-oleyl sulfosuccinate, Nonyl-phenol ethoxylate, myristyl-cetyl dimethyl oxide, lauric acid diethanolamine, Cocoamidopropyl betaine, lauryl amine oxide, coco imidazoline monocarboxylate, Cocoamphocarboxyl glycinate, Bis (2-hydroxy-ethyl) cocoaoxide, cetyl dimethyl benzyl ammonium chloride, Dimethyl aminopropylamine and mixtures thereof.

25. The foamable dental fluoride gel composition of claim 7, wherein said micro-emulsion thickener is present in an amount from about 1.0 to about 3.0% by weight.

26. The foamable dental fluoride gel composition of claim 7, wherein said micro-emulsion thickener is selected from the group consisting of cetyl alcohol, sodium monostearate, PEG-150 Pentaerythrityl tetrastearate and mixtures thereof.

27. The foamable dental fluoride gel composition of claim 26, wherein said micro-emulsion thickener is PEG-150 Pentaerythrityl tetrastearate.

28. The foamable dental fluoride gel composition of claim 7, further comprising from about 0.5 to about 10.0% by weight of a gel clarifying agent.

29. The foamable dental fluoride gel composition of claim 28, wherein said clarifying agent is present in an amount from about 1.0 to about 6.0% by weight.

30. The foamable dental fluoride gel composition of claim 28, wherein said clarifying agent is denatured ethyl alcohol.

31. An aerosol container for delivering a self foaming dental fluoride gel, comprising:

- i) a barrier bag within said aerosol container comprising:
  - a) a water soluble fluoride component present in an amount sufficient to provide from about 0.5 to about 10.0% by weight available fluoride;
  - b) from about 2.0 to about 30.0% by weight of an oil-in-water emulsifier;
  - c) from about 0.5 to about 30.0% by weight of a surfactant;
  - d) from about 0.5 to about 5.0% by weight of a micro-emulsion thickener;
  - f) from 0 to about 10.0% by weight of a gel clarifying agent; and
  - g) from about 2.0 to about 8.0% by weight of a first propellant having a vapor pressure of from about 10 to about 46 psig; and
- ii) a pressurized region within said aerosol container and surrounding said barrier bag, said pressurized region containing a second propellant having a vapor pressure of from about 14 to about 20 psig greater than vapor pressure of said first propellant.

32. The aerosol container of claim 31, wherein said first propellant is a blend of about equal parts n-butane and isopentane.

33. The aerosol container of claim 31, wherein said first propellant is a blend of about 20% by weight isobutane and 80% by weight isopentane.

34. The aerosol container of claim 31, wherein said first propellant is present in an amount of about 3% by weight.

35. The aerosol container of claim 31, wherein said second propellant is a mixture of

isobutane and propane, and said mixture has a vapor pressure of about 46 psig.

36. The aerosol container of claim 31, wherein said second propellant is present in an amount of about 4% by weight.